

AC NO: 20-94

DATE: 3/4/76



ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

SUBJECT: DIGITAL CLOCK **INSTALLATION IN AIRCRAFT**

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1. **PURPOSE.** This advisory circular provides guidelines for operating and installing digital clocks in aircraft.
 2. **REFERENCES.** Civil Air Regulations, Parts **3, 4a, 4b, 6,** or Federal Aviation Regulations (FAR) Parts **23, 25, 27, 29, 91,** and **121.**
 3. **BACKGROUND.** The development of the digital clock is the result of advanced technology, and that technology is likely to produce different kinds of timing devices in the future. To promote safety, our regulations should be sufficiently flexible to permit the use of more advanced timing devices that **are equivalent** to sweep-second hand clocks. Recent inquiries from members of **the aviation** community and manufacturers have indicated a need for information concerning approval and installation of digital clocks on certificated aircraft.
 4. **EQUIPMENT.** Digital clocks may be approved as specified in FAR **91.33(a)** (FAA-approved equivalents) for installation in certificated aircraft in place of clocks with **sweep-second** hands, required by FAR **91.33(d)(6),** if **the digital** clocks provide the following:
 - a. A display of hours, minutes, and seconds. The displays may all appear simultaneously or may be individually selected.
 - b. When minutes and seconds are selected by a switching action, the switching action should not reset either the real time or the lapsed time.

In addition, the following features would be desirable:

 - c. A test function on each clock for testing the operations of all **light-emitting** diodes or incandescent bar lights.
 - d. A power failure indicator to display the fault until the indicator has been manually reset in the event of a power failure or power interruption of more than five seconds.
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Initiated by: **AFS-804/AFS-130**

5. INSTALLATION CRITERIA.

- a. The digital clock should be connected to a reliable aircraft power source that will minimize interruption of a clock operation.
- b. The installation should be accomplished in accordance with AC 43.13-2, Acceptable Methods, Techniques and Practices, Aircraft Alterations. In addition, the clock and airframe manufacturer's instructions should be consulted.
- c. The clock function switch position identification and the digital readout should be readable in all lighting conditions from the pilot's normal position.
- d. Digital clock installations should be free from hazards in themselves and in their methods of operations and should not affect the response or accuracy of any installed equipment.

6. *****

- a. Each person performing the installation of a digital clock should complete adequate testing to assure that the original type certification of the aircraft has not been **compromised** and that the aircraft is in an airworthy condition.
- b. Digital clocks should adequately perform their intended function under all probable environmental operating conditions.
- c. Particular emphasis should be given to temperature and vibration, and testing should ensure that there are no adverse electromagnetic interference effects **(EMI)**.

7. INSTALLATION APPROVAL. Federal Aviation Administration field inspectors, in making their approval, will ensure that the installation is accomplished in accordance with data acceptable to or approved by the Administrator. This can be in the form of a Supplemental **Type** Certificate, FAA Form 8110-2, or Major Repair and Alteration, **FAA** Form 337 (OMB 04-R0060).



R. P. SKULLY
Director, Flight Standards Service